Bronchoprovocation testing for diagnosis of EIB in Athletes: Is one test enough?

Oliver J. Price[1], Les Ansley[1] James H. Hull[1, 2]

[1]Faculty of Health and Life Sciences, Northumbria University, Newcastle, United Kingdom (UK); [2] Department of Respiratory Medicine, Royal Brompton Hospital, London.

Background: Exercise-induced bronchoconstriction (EIB) is highly prevalent in athletes and impacts on their health and performance. The gold-standard means for diagnosing EIB is indirect bronchoprovocation testing, however the repeatability of this methodology is not established. **Aims and objectives:** To evaluate the short-term test-retest repeatability of eucapnic voluntary hyperpnea (EVH). **Methods:** Twenty-five recreationally active men (*n*=21) and women (*n*=4) were recruited. Participants were required to attend on two separate occasions separated by a period of fourteen days. Participants performed spirometry before and following (at 3,5,10 and 15 mins) an EVH challenge (6 minutes at 85% maximum voluntary ventilation). Difference in forced expiratory volume in one second (FEV_1) between visits was analysed using Bland-Altman methodology. **Results:** 22 subjects completed both visits (*n*=3 excluded - unwell), mean (SD) age 25 (±4) yrs, FEV_1 102 (±8.6) % predicted. There was no significant difference in maximum fall in FEV_1 post EVH between visits (P>0.05), however Bland-Altman analysis revealed wide limits of agreement (-10.36-7.9%) for the difference in fall in FEV_1 between visits. A diagnosis of EIB (>10% fall in FEV_1) was established in two athletes at visit one whereas this increased to five athletes at visit 2. Importantly, only one athlete had a diagnosis of EIB confirmed at both visits. **Conclusion:** In this cohort of athletes EVH demonstrated poor repeatability over a fixed two-week period. The findings highlight the need for caution when considering confirming or refuting a diagnosis of EIB based on a solitary indirect bronchoprovocation test and a cut-off value of 10% fall in FEV_1.